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DECLARATION OF ACCURACY OF TRANSLATION
IN LIEU OF SWORN TRANSLATION (37 C.F.R. 1.68)

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certifies and declares that:

(1) I am fully conversant both with the Japanese and English languages.

(2) I have translated into English Japanese Patent Application Number 2000-123965 filed in Japan on April 25, 2000. A copy of said English translation is attached hereto.

(3) The translation is, to the best of my knowledge and belief, an accurate translation from the Japanese into the English language.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001, of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the matter with which this translation is used.

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[TITLE OF THE INVENTION] SONG WORD COMPOSING APPARATUS, SONG WORD COMPOSING METHOD AND RECORDING MEDIUM RECORDED WITH SONG WORD COMPOSING PROGRAM

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[Name of Article]	Drawings	1
[Name of Article]	Abstract	1

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[NAME OF DOCUMENT] SPECIFICATION

[NAME OF THE INVENTION] SONG WORD COMPOSING APPARATUS, SONG WORD COMPOSING METHOD AND RECORDING MEDIUM RECORDED WITH SONG WORD COMPOSING PROGRAM

[SCOPE OF CLAIM FOR A PATENT]

[Claim 1] A word composing apparatus characterized by comprising:

a melody display means for visually displaying a given melody on a display device;

an input cell display means for displaying an input cell corresponding to each note of the melody on the display device; and

an input process means for executing a process of inputting a letter or letters or a character or characters of a song word corresponding to a note or notes to the input cell.

[Claim 2] A word composing apparatus characterized by comprising:

a melody display means for visually displaying a given melody on a display device;

an input cell display means for displaying an input cell corresponding to each note of the melody on the display device;

an input process means for executing a process of inputting a letter or letters or a character or characters of a song word corresponding to a note or notes to the input cell; and

a continuous letter or character display means for displaying a continuous letter or character train in a continuous display area of the display, and displaying letters or characters input to the input cells in the continuous display area as a continuous song word letter or character train.

[Claim 3] A word composing apparatus according to claim 2, characterized in

that said input processor allows a command to be input to the input cell, the command controlling a display style of a song word letter or character train in the continuous display area.

[Claim 4] A word composing apparatus according to claim 2, characterized in that said continuous letter or character display means displays a symbol in the continuous display area at a position corresponding to the input cell in which a letter or character for the song word is not input, the symbol indicating that a letter or character is not still input.

[Claim 5] A word composing apparatus characterized by comprising:

a dictionary storing at least words and parts of speech corresponding to the words;

a search condition designate means for designating at least a part of speech as a search condition;

a word search means for searching a word matching the search condition designated by said search condition designator from said dictionary;

a search result display means for displaying a searched word; and

an input process means for executing a process of inputting a word displayed on said search result display means as letters or characters of a song word.

[Claim 6] A word composing apparatus according to claim 5, characterized in that said search condition designate means designates at least the number of sounds and a part of speech as the search condition.

[Claim 7] A word composing apparatus according to claim 5, characterized in that said search condition designate means counts a letter or character train containing predetermined letters or characters as both one sound and two sounds, as a method of counting the number of sounds of a word in said

dictionary.

[Claim 8] A word composing apparatus characterized by comprising sentence syntax store means for storing a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech, and selecting a sentence syntax template from said sentence syntax store means to determine an order of parts of speech.

[Claim 9] A word composing apparatus characterized by comprising:

sentence syntax store means for storing a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech; and

melody divide means for dividing a given melody into a plurality of melody sections,

and making each section divided by said melody divide means have a correspondence with a sentence syntax template selected from said sentence syntax store means to determine a part of speech of each melody section.

[Claim 10] A word composing method characterized by visually displaying a given melody, providing an input cell in correspondence with each note of the melody, and inputting a letter or letters or a character or characters of a song word corresponding to each note to a corresponding input cell.

[Claim 11] A word composing method characterized by visually displaying a given melody, providing an input cell corresponding to each note of the melody and a continuous display area for displaying a continuous letter or character train, and displaying a letter or letters or a character or characters input to each input cell in the continuous display area as a continuous letter or character train.

[Claim 12] A word composing method characterized by using a dictionary

storing at least words and parts of speech corresponding to the words, designating at least a part of speech as a search condition, searching a word matching the search condition and adopting the searched word as part of a song word to be input.

[Claim 13] A word composing method characterized by using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech and selecting one of the sentence syntax templates to determine an order of parts of speech.

[Claim 14] A word composing method characterized by using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech, dividing a given melody into a plurality of melody sections and making each melody section have a correspondence with a selected sentence syntax template to determine a part of speech of each melody section.

[Claim 15] A recording medium recorded with a word composing program for making a computer execute:

a process of visually displaying a given melody;

a process of providing an input cell corresponding to each note of the melody; and

a process of inputting a letter or letters or a character or characters of a song word corresponding to each note to the input cell.

[Claim 16] A recording medium recorded with a word composing program for making a computer execute:

a process of visually displaying a given melody;

a process of providing an input cell in correspondence with each note of the melody;

a process of providing a continuous display area for displaying a

continuous letter or character train; and

a process of displaying a letter or letters or a character or characters input to each input cell in the continuous display area as a continuous letter or character train.

[Claim 17] A recording medium recorded with a word composing program for making a computer execute:

a process of using a dictionary storing at least words and parts of speech corresponding to the words and designating at least a part of speech as a search condition;

a process of searching a word matching the search condition from the dictionary storing at least words and parts of speech corresponding to the words; and

a process of adopting the searched word as part of a song word to be input.

[Claim 18] A recording medium recorded with a word composing program for making a computer execute a process of using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech and selecting one of the sentence syntax templates to determine an order of parts of speech.

[Claim 19] A recording medium recorded with a word composing program for making a computer execute a process of using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech and dividing a given melody into a plurality of melody sections; and a process of making each melody section have a correspondence with a selected sentence syntax template to determine a part of speech of each melody section.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[Technical Field to which the Invention Belongs]

The present invention relates to a word composing apparatus, a word composing method and a recording media recorded with a word composing program which aid work of composing words of a song.

[0002]

[Prior Art]

As a conventional word composing apparatus, a word composition aiding apparatus is known which is disclosed in JP-A-10-97529. This apparatus divides music into a plurality of paragraphs, sets a word composing condition to each paragraph, derives words matching the word composing condition from a "poem piece data bank" to present them to a user, and stores the word selected by the user to compose words. The apparatus also detects the number of syllables of a given melody so that words matching the number of syllables are derived from the "poem piece data bank".

[0003]

[Subject to be Solved by the Invention]

With this conventional apparatus, however, there is a problem that it is not easy to understand a correspondence between each note of a given melody and a character of song words. In deriving words matching the number of syllables of a melody, it is desired to consider a "phonetic sound" of each character to derive more general song words. For example, a word "かん" is pronounced either as two notes of "か" and "ん" or as a single note of "かん". If words having the number of characters equal to the number of syllables are derived, only the words corresponding to the two tones in this example are derived and the words of the latter case cannot be derived. Since it is very

difficult for a novice songwriter to understand what part of speech is placed at which position to compose good song words, it is effective to aid a songwriter in such a point. However, the above-mentioned conventional apparatus was made without taking such a point into consideration and was not good enough to compose song words matching a melody.

[0004]

It is an object of the present invention to provide an effective aid in composing song words matching a melody.

[0005]

[Means for Solving the Subject]

A word composing apparatus of claim 1 of the present invention is characterized by comprising a melody display means for visually displaying a given melody on a display device; an input cell display means for displaying an input cell corresponding to each note of the melody on the display device; and an input process means for executing a process of inputting letters or characters of a song word corresponding to a note to the input cell.

[0006]

A word composing apparatus of claim 2 of the invention is characterized by comprising a melody display means for visually displaying a given melody on a display device; an input cell display means for displaying an input cell corresponding to each note of the melody on the display device; an input process means for executing a process of inputting letters or characters of a song word corresponding to a note to the input cell; and a continuous letter or character display means for displaying a continuous letter or character train in a continuous display area, and displaying letters or characters input to the input cells in the continuous display area as a continuous song word letter or

character train.

A continuous letter or character train includes a train of long song words displayed in rows and a train containing spaces intentionally inserted. The continuous letter or character train has continuous letters or characters in at least two adjacent input cells.

[0007]

A word composing apparatus of claim 3 of the invention is provided with the constituent elements of claim 2 and characterized in that the input process means allows a command to be input to the input cell, the command controlling a display style of a song word letter or character train in the continuous display area.

[0008]

A word composing apparatus of claim 4 of the invention is provided with the constituent elements of claim 2 and characterized in that the continuous letter or character display means displays a symbol in the continuous display area at a position corresponding to the input cell in which a letter or character for the song word is not input, the symbol indicating that a letter or character is not still input.

[0009]

A word composing apparatus of claim 5 of the invention is characterized by comprising a dictionary storing at least words and parts of speech corresponding to the words; a search condition designate means for designating at least a part of speech as a search condition; a word search means for searching a word matching the search condition designated by the search condition designator from the dictionary; a search result display means for displaying a searched word; and an input process means for executing a

process of inputting a word displayed on the search result display unit as letters or characters of a song word.

[0010]

A word composing apparatus of claim 6 of the invention is provided with the constituent elements of claim 5 and characterized in that the search condition designate means designates at least the number of sounds and a part of speech as the search condition.

[0011]

A word composing apparatus of claim 7 of the invention is provided with the constituent elements of claim 5 and characterized in that the search condition designate means counts a letter or character train containing predetermined letters or characters as both one sound and two sounds, as a method of counting the number of sounds of a word in said dictionary.

[0012]

A word composing apparatus of claim 8 of the invention is characterized by comprising a sentence syntax store means for storing a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech, and selecting a sentence syntax template from said sentence syntax store means to determine an order of parts of speech.

[0013]

A word composing apparatus of claim 9 of the invention is characterized by comprising a sentence syntax store means for storing a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech and a melody divide means for dividing a given melody into a plurality of melody sections, and making each section divided by said melody divide means have a correspondence with a sentence syntax template selected

from said sentence syntax store means to determine a part of speech of each melody section.

[0014]

A word composing method of claim 10 of the invention is characterized by visually displaying a given melody, providing an input cell in correspondence with each note of the melody, and inputting a letter or letters or a character or characters of a song word corresponding to each note to a corresponding input cell.

[0015]

A word composing method of claim 11 of the invention is characterized by visually displaying a given melody, providing an input cell in correspondence with each note of the melody and a continuous display area for displaying a continuous letter or character train, and displaying a letter or letters or a character or characters input to each input cell in the continuous display area as a continuous letter or character train.

[0016]

A word composing method of claim 12 of the invention is characterized by using a dictionary storing at least words and parts of speech corresponding to the words, designating at least a part of speech as a search condition, searching a word matching the search condition and adopting the searched word as part of a song word to be input.

[0017]

A word composing method of claim 13 of the invention is characterized by using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech, and selecting one of the sentence syntax templates to determine an order of parts of speech.

[0018]

A word composing method of claim 14 of the invention is characterized by using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech, dividing a given melody into a plurality of melody sections, and making each melody section have a correspondence with a sentence syntax template selected from the plurality of sentence syntax templates to determine a part of speech of each melody section.

[0019]

A recording medium of claim 15 of the invention is recorded with a word composing program for making a computer execute a process of visually displaying a given melody, a process of providing an input cell corresponding to each note of the melody, and a process of inputting a letter or letters or a character or characters of a song word corresponding to each note to the input cell.

[0020]

A recording medium of claim 16 of the invention is recorded with a word composing program for making a computer execute a process of visually displaying a given melody, a process of providing an input cell in correspondence with each note of the melody; a process of providing a continuous display area for displaying a continuous letter or character train, and a process of displaying a letter or letters or a character or characters input to each input cell in the continuous display area as a continuous letter or character train.

[0021]

A recording medium of claim 17 of the invention is recorded with a

word composing program for making a computer execute a process of using a dictionary storing at least words and parts of speech corresponding to the words and designating at least a part of speech as a search condition, a process of searching a word matching the search condition from the dictionary storing at least words and parts of speech corresponding to the words, and a process of adopting the searched word as part of a song word to be input.

[0022]

A recording medium of claim 18 of the invention is recorded with a word composing program for making a computer execute a process of using a plurality of sentence syntax templates each defining a typical order of a plurality of parts of speech and selecting one of the sentence syntax templates to determine an order of parts of speech.

[0023]

According to the word composing apparatus of claim 1, word composing method of claim 10 or the execution of the word composing program recorded in the recording medium of claim 15, it becomes easy to understand a relation between each note of a melody and a letter(s) or character(s) of song words.

[0024]

According to the word composing apparatus of claim 2, word composing method of claim 11 or the execution of the word composing program recorded in the recording medium of claim 16, continuous words separated in respective input cells can be displayed as a continuous letter or character train and can easily be understood.

[0025]

According to the word composing apparatus of claim 3, the same

functions and effects as those of claim 2 are obtained and words of a continuous letter or character train can be made easy to read.

[0026]

According to the word composing apparatus of claim 4, the same functions and effects as those of claim 2 are obtained and input cells still not input with song word letters or characters can easily be found.

[0027]

According to the word composing apparatus of claim 5, word composing method of claim 12 or the execution of the word composing program recorded in the recording medium of claim 17, a word can be selected by designating a part of speech.

[0028]

According to the word composing apparatus of claim 6, the same functions and effects as those of claim 5 are obtained and a word can be selected by designating the number of sounds and a part of speech;

[0029]

According to the word composing apparatus of claim 7, the same functions and effects as those of claim 5 are obtained and a plurality of letters or characters can be made to have a correspondence to one note.

[0030]

According to the word composing apparatus of claim 8, word composing method of claim 13 or the execution of the word composing program recorded in the recording medium of claim 18, an order of parts of speech can be determined by simply selecting a sentence syntax template.

[0031]

According to the word composing apparatus of claim 9 or word

composing method of claim 14, each section of melody can easily be made to have a correspondence to a part of speech.

[0032]

[Embodiments]

Embodiments of the invention will be described with reference to the accompanying drawings. Fig. 5 is a block diagram of an embodiment wherein a word composing apparatus of the invention is constituted of a personal computer and software. The personal computer has a CPU 1, a ROM 2, a RAM 3, a timer 4, a display 5, a mouse 6, a keyboard 7, DSP (a digital signal processor) 8, DAC (a D/A converter) 9, a sound system 10, an external storage device 11, a MIDI interface 12, a communication interface 13 and a bus 14. DSP 8, DAC 9 and MIDI interface 12 are mounted on a sound card or the like. Interfaces of the display 5, mouse 6, keyboard 7 and external storage device 11 are not shown.

[0033]

CPU 1 runs on OS (an operating system) installed, for example, in a hard disk drive (HDD) of the external storage device 11 by using a working area of RAM 3 to execute a normal control operation. Specifically, CPU 1 executes a display control of the display 5, inputs data in response to an operation of the mouse 6 and keyboard 7, controls the display position of the mouse pointer on the display 5, and detects a click operation of the mouse 6. In this manner, an input setting operation by a user can be performed by a so-called graphical user interface (GUI) process with the display screen of the display 5 and the operation of the mouse 6.

[0034]

When melody data is reproduced, CPU 1 executes an interrupt process in response to an interrupt signal from the timer 4 to reproduce tone data in the melody data or supply data of each performance to a tone generator in DSP 8. DSP 8 generates digital musical tone signals corresponding to the data supplied from CPU 1. In DAC 9 the digital musical tone signal is converted into an analog audio signal which generates musical sounds in the sound system 10 including an amplifier, a speaker and the like.

[0035]

The external storage device 11 may be a hard disk drive (HDD), a floppy disk drive (FDD), a CD-ROM drive, a magneto optical (MO) disc drive, a digital versatile disk (DVD) drive or the like. For example, the external storage device 11 supplies melody data and a word composing program. The external storage device 11 is also used for storing composed word data and as databases for dictionaries and sentence syntax templates. The MIDI interface 12 transfers various data to and from another MIDI instrument 15. For example, the MIDI interface 12 is capable of receiving melody data supplied from the MIDI instrument 15 and outputting composed word data to the MIDI instrument 15.

[0036]

The word composing apparatus can be connected via the communication interface 13 to a communication network 16 such as LAN (a local area network), the Internet and a telephone line so that it can receive from a server computer 17 various data such as a word composing program, melody data, Japanese dictionary data, and sentence syntax template data. In this embodiment, the data including the word composing program, melody data, dictionary data, and sentence syntax template data is stored in the hard disk

drive (HDD) of the external storage device 11. CPU 1 develops the word composing program stored in the hard disk drive (HDD) upon RAM 3 and executes the program in RAM 3 to control a word composing process.

[0037]

(1st Embodiment)

Fig. 2 is a block diagram showing functions of the main part of the word composing apparatus according to the first embodiment. An input designating unit A is the mouse 6 and keyboard 7, a word input/edit unit B is an input area set on the display 5 (and a graphic RAM and the like), a word continuous display unit C is a display area set on the display 5 (and a graphic RAM and the like), a melody data storage unit D is RAM 3 or the external storage device 11 for storing melody data for which words are composed, and a melody display unit E is a display area set on the display 5 (and a graphic RAM and the like).

[0038]

A process at each unit works as CPU 1 executes the word composing program. In accordance with the melody data stored in the melody data storage unit D, a melody is visually displayed on the melody display unit E. Specifically, note bars are displayed on a piano roll score as note display elements. In accordance with the melody data stored in the melody data storage unit D, the word input/edit unit B is displayed by separating it into input cells corresponding to respective notes. When the input designating unit A inputs each character to the word input/edit unit B, characters input from the word input/edit unit B are displayed as a continuous character train on the word continuous display unit C.

[0039]

Figs. 1 is a diagram showing an example of a word composing display screen of the display 5. On this word composing display screen, a piano roll score 20 corresponding to the melody display unit E, a word input/edit area 30 corresponding to the word input/edit unit B, and a word continuous display area 40 corresponding to the word continuous display unit C are displayed. The piano roll score 20 has a laterally elongated area divided in an up/down direction to simulate a piano keyboard. Each area divided in the up/down direction corresponds to the pitch of each key of the piano, the lower area being a lower pitch key and the higher area being a higher pitch key. The horizontal direction from the left to right corresponds to a time lapse direction. A measure line L1 is displayed to partition each measure in the time lapse direction. A tempo line L2 is displayed corresponding to a tempo position. Note bars 21_1, 21_2,..., 21_8 corresponding to notes are displayed as note display elements of the melody. The suffix of the reference numeral is used for distinguishing between a plurality of same elements. In the following description, if the elements are not necessary to be distinguished, the suffix is omitted. The note bar 21 indicates a location (time position) along the right/left direction on the screen, and the length of the note bar 21 indicates a gate time (reproduction continuation time) of the note. In this example, a four-four time is used, other times may also be used.

[0040]

The word input/edit area 30 is displayed just under the piano roll score 20 and is divided into input cells 31_1, 31_2,..., 31_8 each having the length corresponding to a tempo number of each note bar 21. The length of the note bar 21 corresponds to the gate time. Therefore, for example, a quarter note does not have one tempo length (a distance between tempo lines L2). Each

input cell 31 has a length corresponding to the length of a corresponding note in accordance with the location of each note bar 21. For example, in Figs. 1A and 1B, the note bars 21_1, 21_2, 21_3, 21_6, 21_7 and 21_8 are quarter notes and the corresponding input cells 31_1, 31_2, 31_3, 31_6, 31_7 and 31_8 have a one-tempo length, whereas the note bars 21_4 and 21_5 are half notes and the corresponding input cells 31_4 and 31_5 have a two-tempo length. The length of each input cell may be set to the gate time (length of the note bar).

[0041]

Each input cell 31 is input with a character(s) or a command (hereinafter called a "display control command") for controlling a display style of words or a song word character train. In the example shown in Fig. 1, "あ" is input to the input cell 31_1, "し" is input to the input cell 31_2, "た and an enter command" are input to the input cell 31_3, "てん" is input to the input cell 31_4, "き" is input to the input cell 31_5, "な" is input to the input cell 31_7. The input cells 31_6 and 31_8 are still not input.

The word continuous display area 40 is displayed under the word input/edit area 30 and displays a continuous letter or character train in a plurality of rows and columns. In the example shown in Fig. 1, a character or letter train "あした" is displayed in the first row, the train having continuous letters "あ", "し" and "た" in the input cells 31_1, 31_2 and 31_3, and the enter command input to the input cell 31_3 returns the first row. In the second row, a character or letter train "てんき" is displayed, the train having continuous letters "てん" and "き" in the input cells 31_4 and 31_5, and no letter or character is input to the input cell 31_6 so that this input cell is empty, and the letter "な" in the input cell 31_7 is displayed.

For example, since no letter or character is input to the input cells

31_6 and 31_8, a non-input symbol 41 (in the example shown in Fig. 1, □) is displayed to indicate that no letter or character is input. By simply looking at the word continuous display area 40, it is easy to confirm a presence of an input cell 31 without any input letter or character and a corresponding note bar 21. The non-input symbol is not displayed after the position of the enter command as in the first row.

[0044]

Fig. 3 is a diagram illustrating an input operation of inputting a character or the like to the input cell 31. As the pointer P of the mouse is moved to the input cell 31 and the mouse is left-clicked, an editor area 31A for input only is displayed. In this state, a character is input, for example, by using the keyboard 7. This character input process can be realized by well-known techniques such as a word processor function (e.g., Japanese language input function) of a personal computer. By opening the editor area 31A and selecting a character or word displayed in a search result list box as in second and third embodiments to be described later, a character or word can be input. By operating a return key, the editor area 31A disappears and letters or characters (or words) input to the editor area 31A are input to the input cell 31.

[0045]

Fig. 4 is a diagram illustrating an input operation of inputting a display control command. As the pointer P of the mouse is moved to the input cell 31 and the mouse is right-clicked, a command select box 31B is displayed. In this command select box 31B, the names (space, hyphen, enter and the like) of a display control command are displayed. The display control command is used for controlling the display style of a song word character train in the word continuous display area (continuous display unit) 40. By using the pointer P of

the mouse 6 or the cursor keys of the keyboard 7, a command in the command select box 31B is selected so that the selected command is input to the input cell 31. The letter(s) or character(s) or command data input (established) to the input cell 31 is written in the storage area of RAM 3. In accordance with the stored data, a letter(s) or character(s) is displayed in the word continuous display area 40. Specifically, when the "space" is selected, a space (an empty area without the non-input symbol 41) is inserted in the word continuous display area 40, when the "hyphen" is selected, a hyphen is inserted, and when the "enter" is selected, an enter is inserted.

[0046]

As the display control command is input, the display style of the word continuous display area 40 is changed. In this case, "_" for the space, "-" for the hyphen and "↵" for the enter may be displayed in the input space as the display control command. The user can confirm such display easily.

[0047]

Fig. 6 is a flow chart illustrating a main routine of the word composing program according to the embodiment, and Fig. 7 is a flow chart illustrating a sub-routine of the word input/edit process. The control operation of CPU 1 will be described with reference to each flow chart. As the main routine shown in Fig. 6 starts, at Step S1 an overall display screen of the piano roll score 20, word continuous display area 40 and the like are displayed (the word input/edit area 30 is displayed later). At Step S2 a user designates a melody select process including a step of reading melody data from the hard disk drive or the like of the external storage device 11. Next, at Step S3, note bars 21 corresponding to the notes of the selected melody are displayed on the piano roll score 20. At Step S4, the word input/edit process shown in Fig. 7 is

executed. At Step S5 other processes are executed to thereafter return to Step S1. The other processes include a process of saving the composed words.

[0048]

In the word input/edit process shown in Fig. 7, at Step S11 in accordance with the selected melody data, the word input/edit area 30 is displayed by dividing it into input cells 31 corresponding to the notes of the melody, and the non-input symbol 41 ("□") is displayed in each row and column of the word input/edit display area 40. Next, at Step S12 it is checked whether there is a left click operation of the mouse on any input cell 31. If there is no left click operation, the flow branches to Step S16, whereas if there is a left click operation, the editor area 31A is displayed at Step S13. Next, at Step S14 an input operation of inputting a letter(s) or character(s) is performed in the editor area 31A, and data of the input letter(s) or character(s) is stored in the memory (e.g., RAM 3) and the input letter(s) or character(s) is displayed in the word continuous display area 40. Namely, the input letter(s) or character(s) is displayed by replacing it by the non-input symbol 41 ("□"). At Step S15 the editor area 31A is closed to follow Step S16. With the above processes, an input process of inputting a letter(s) or character(s) can be performed as described with reference to Fig. 3.

[0049]

At Step S16 it is checked whether there is a right click operation of the mouse on any input cell 31. If there is no right click operation, the flow skips to Step S19, whereas if there is a right click operation, the command select box 31B is opened and the display control command is displayed at Step S17. Next, at Step S18 a process of selecting the display control command by

the user is executed, the selected display command is stored in the memory (e.g., RAM 3), and in accordance with the selected display control command, the display style of the word continuous display area 40 is controlled to thereafter close the command select box 31B and advance to Step S19. At Step S19 it is checked whether there is a termination instruction of the word input/edit work. If there is a termination instruction, the flow returns to the main routine, whereas if there is no termination instruction, the flow returns to Step S12. With the above processes, an operation of inputting the display control command described with reference to Fig. 4 can be performed.

[0050]

In the above-described embodiment, when the input cell is to be selected, the pointer P is moved to the input cell and the left click of the mouse is performed. When the succeeding input cell is to be selected, the arrow key (→ or ←) or a TAB key of the keyboard may be used. By operating the enter key or the like in the state that the input cell is selected, the editor area 31A may be opened. Further, although after the input cell is selected and the editor area 31A is opened, a character(s) or display control command is input, the character(s) or display control command may be written directly in the input cell.

[0051]

Also in the above embodiment, although note bars 21 are displayed on the piano roll score 20 to visually display the melody, the melody may be displayed on a staff notation or a TAB score.

[0052]

(2nd Embodiment)

Next, the second embodiment will be described. The second embodiment pertains to a function of aiding a user in determining a character(s)

or word(s) of song words. A process of inputting a character(s) or word(s) determined by the second embodiment and a process of displaying an input display screen can use the processes of the first embodiment including the process of inputting a character(s) to the input cell and the process of displaying the piano roll score 20, word input/edit area 30 and word continuous display area 40.

[0053]

Fig. 8 is a block diagram showing the main part of the second embodiment. A search condition designation unit F and a search start instruction unit G are made of GUI utilizing the mouse 6 or keyboard 7 and a screen of the display 5. A search result list display unit H is a list box or the like displayed on the display 5. A word search unit I is a function obtained while CPU 1 executes the word composing program of the second embodiment of the invention. A Japanese dictionary J is a database stored in a hard disk or the like of the external storage device 11. A select/input unit K is, for example, the input cell 31, editor area 31A or the like of the first embodiment.

[0054]

As shown in Fig. 9, the Japanese dictionary J to be searched has a number of sets of a word and a part of speech registered. The part of speech includes a noun, a pronoun, a verb, an adjective, an adjective verb, a participial adjective, an adverb, a conjunction, an interjection, an auxiliary verb, a postpositional auxiliary word, and the like. The word includes echo-words, imitative words and the like.

[0055]

Figs. 10 is a diagram showing input display screens corresponding to the search condition designation unit F. The input display

screens display an input menu 51 for inputting the number of sounds and an input menu 52 for inputting a part of speech. The input menus 51 and 52 display the number of sounds and the part of speech presently selected. In the usual case, only the input menus 51 and 52 are displayed. When the pointer P of the mouse 6 is moved to either a pull-down switch 51a or 52a and the mouse is clicked, a select box 52A such as shown in Fig. 10(B) is displayed. When the pointer P of the mouse 6 is moved to any one of the parts of speech displayed in the select box 52A and the mouse is clicked, or any one of the parts of speech is selected by using an arrow key (↑ or ↓) and the enter key, the selected part of speech is displayed in the input menu 52. Similarly, the pull-down menu for the input menu 51 for inputting the number of sounds displays "one-sound word (a letter or letters or a character or characters), two-sound word, three-sound word,....".

[0056]

As the search condition including the number of sounds and the part of speech is entered by using the search condition designation unit F in the manner described above, the entered search condition is sent to the word search unit I. The search condition may be selected from any one of candidates prepared beforehand or a user may designate and input any word.

[0057]

Next, when the search start instruction unit G instructs the word search unit I to start a search, the word search unit I sequentially read words registered in the Japanese dictionary J, judges whether the read word matches the search condition, and picks up the word matching the search condition. In this pickup process, the number of sounds of a read word is calculated based upon sound number count rules to be described later, and it is judged whether

the counted number of sounds satisfies the search condition and whether the part of speech of the read word satisfies the search condition. For example, if the search condition is "two-sound word (a letter or letters or a character or characters) and noun" as shown in Fig. 10, it is judged whether the read word is a two-sound word and whether the part of speech field of the read word indicates a noun. In this manner, words of a two-sound word and a noun are picked up. Other search conditions may also be applied. For example, the characteristics of a word may be used as the search condition, such as "human related words", "animal related words", "nature related words", and "place name related words" for the noun words.

[0058]

The following five sound number count rules are known.

1) For a word having a small letter such as "しゃ" and "ちゃ", the small letter is not counted.

2) For a word having "ん" at a position except the start position such as "かん" and "らん", the "ん" is counted in some cases and not counted in other cases.

3) For a word having "う" at a position except the start position such as "とう" and "そう", the "う" is counted in some cases and not counted in other cases.

4) For a word having "あ" at a position except the start position such as "かあ" and "まあ", the "あ" is counted in some cases and not counted in other cases.

5) A prolonged sound "-" in a katakana word is counted in some cases and not counted in other cases.

[0059]

These sound number count rules are applied in the manner as in the following specific examples.

When a word "いしゃ" is read, the rule 1) is applied. Since "い"

and "しゃ" are both one sound, it is judged that the word is a two-sound word.

When a word "かんたん" is read, the rule 2) is applied. Since "かん" and "たん" are both one sound or two sounds, it is judged that the word "かんたん" corresponds to each of a two-sound word, a three-sound word and a four-sound word.

When a word "あいきどう" is read, the rule 3) is applied. A word "あいきど" has each one sound and four sounds in total. Since "う" is counted in some cases and not counted in other cases, it is a zero-sound word or a one-sound word. Therefore, it is judged that the word "あいきどう" corresponds to each of a four-sound word and a five-sound word.

When a word "かあさん" is read, the rules 2) and 4) are applied. A letter "か" of "かあ" is one sound and a letter "あ" is either zero sound or one sound according to the rule 4) so that the whole of "かあ" is one sound or two sounds. Similar to the explanation of "かんたん", "さん" is either one sound or two sounds. Therefore, it is judged that the word "かあさん" corresponds to each of a two-sound word, a three-sound word and a four-sound word.

When a word "アーチ" is read, the rule 5) is applied. Since "—" is counted in some case and not counted in other cases, it is a zero-sound word or a one-sound word. Both "ア" and "チ" are one sound. Therefore, it is judged that the word "アーチ" corresponds to each of a two-sound word and a three-sound word.

[0060]

The search result is sent to the search result list display unit H. The search result list display unit H displays a search result list box such as shown in Fig. 11 and displays searched words in this search result list box. An example shown in Fig. 11 corresponds to the examples described above. The

words as the search result candidates for the two-sound word are "アーチ", "あい", "いしゃ", "いか", "かあさん" and "かんたん". Since the word "かんたん" is an adjective verb, the words matching the search condition of "two-sound word" and "noun" are "アーチ", "あい", "いしゃ", "いか", and "かあさん". Although the meaning of each word is displayed in the example shown in Fig. 11, other terms such as synonyms, metonyms, and antonyms may be displayed. The Japanese dictionary J stores these meanings, synonyms, metonyms, antonyms and the like of each word to display them.

[0061]

In order to select a word from the search result list box shown in Fig. 11, the pointer P is moved to the word and the mouse is clicked, or the word is selected by using the arrow key (↑ or ↓) of the keyboard and the enter key. In this manner, the selected word may be input to the input cell 31 or editor area 31A of the first embodiment.

[0062]

In the above-described embodiment, the number of sounds of a read word is counted based upon the sound number count rules. Instead, as shown in a Japanese dictionary of Fig. 12, the number of sounds of each word may be calculated in advance based upon the sound number count rules and stored in the dictionary.

[0063]

(3rd Embodiment)

Next, the third embodiment will be described. In the third embodiment, melody is divided into small melody sections. By using a sentence syntax template, each melody section is made to have a correspondence with a segment, and a word to be assigned to each segment is

searched. As a process of inputting a selected word and a process of displaying input display screens of the third embodiment, the process of inputting a character to the input cell 31 and a process of displaying the piano roll score 20, word input/edit area 30 and word continuous display area 40 of the first embodiment can be applied.

[0064]

Fig. 13 is a block diagram showing functions of the main part of the third embodiment. A database L for sentence syntax templates is stored in a hard disk drive or the like of the external storage device 11. As shown in Fig. 14, for example, a plurality of sentence syntax templates are stored, each template being constituted of a combination of a plurality of segments each corresponding to one part of speech. For example, the first sentence syntax template (at the uppermost row) in Fig. 14, is constituted of three segments including "[noun] が", "[noun] を", and "[transitive verb]".

[0065]

In Fig. 13, a melody division unit N, a segment number coincidence template search unit O, a sound number count unit Q for an unsettled part of speech, a sentence syntax template decision unit R, an unsettled part of speech search unit S and an unsettled vocabulary decision unit U are functions obtained when CPU 1 executes the word composing program of the third embodiment of the invention. Each unit operates as in the following manner.

[0066]

The melody division unit N divides a selected melody M, takes a correspondence between each divided section and a segment to determine the number of segments of the melody. The melody may be divided automatically

in accordance with a predetermined algorithm, or manually by a user. For example, the melody may be divided by setting a note having a long note length to the last of a section, by setting a section partition between notes having a large pitch difference, or by setting a section partition at a position where there is a change in detected chord and tempo.

[0067]

After the melody is divided, the segment number coincidence template search unit O searches the database L to detect the sentence syntax template whose segment number coincides with the melody.

[0068]

A specific example will be described assuming that a melody whose words are to be written has twenty-six sounds and that this melody is divided into six sections, i.e., six segments as indicated by the following formula (1) (Numerals show the number of sounds in each section.):

[5 sounds]/[3 sounds]/[4 sounds]/[5 sounds]/[4 sounds]/[5 sounds] ... (1)

It is then assumed that the following sentence syntax templates ① to ③ having six segments are selected from the sentence syntax template database L:

[adjective]/[noun] と /[adjective]/[noun] が /[noun] を /[transitive verb] ... ①

[adjective]/[noun] が /[noun] を /[adjective]/[noun] で /[transitive verb] ... ②

[adjective]/[noun] が /[noun] を /[adjective]/[noun] のように /[transitive verb] ... ③

In the templates ① to ③, "/" indicates a delimiter for a segment,

and "[ ]" indicates a part of speech having the arbitrary number of sounds. "と", "が" and the like are a postpositional auxiliary word whose sound number is counted in.

[0069]

The sound number count unit Q for an unsettled part of speech calculates the number of sounds of each part of speech in each segment of each sentence syntax template candidate in accordance with the melody segment condition of the formula (1), i.e., the number of sounds of each part of speech. For example, in the case of the template ①, the [adjective] of the first segment is five sounds and the [noun] in the second segment is two sounds (three sounds - one sound) because one sound "と" is added to the second segment. The [noun] in the fourth segment is four sounds (five sounds - one sound) because one sound "が" is added to the fourth segment. Similarly, the number of sounds of each part of speech is calculated for the other templates.

[0070]

Next, the sentence syntax template decision unit R discards the template not satisfying the sound number condition from the template candidates. For example, the number of template candidates is reduced by comparing the number of sounds of each part of speech calculated by the sound number count unit Q for an unsettled part of speech with the number of sounds in each segment of the melody. Namely, the fifth segment of the template ③ has already four sounds of the postpositional auxiliary word of "のように" which is equal to four sounds of the fifth segment of the melody shown in the formula (1). Since the sound number count unit Q for an unsettled part of speech counts as a zero sound the number of sounds of the [noun] in the fifth segment of the template ③, this template ③ is discarded. Therefore, the

templates ① and ② are left. One of these two templates is selected by a user or by using a random number. It is herein assumed that the template ① is selected.

[0071]

The vocabulary database T is stored in a hard disk or the like of the external storage device 11 and stores a number of registered sets of a word and a part of speech. The unsettled part of speech search unit S selects from the vocabulary database T a part of speech designated by the selected template and having the sounds equal in number to the calculated number. For example, for the first segment, an adjective having five sounds (refer to the formula (1)) is selected from the vocabulary database T shown in Fig. 15. For example, two words "すばらしい" and "うつくしい" are selected as candidate words. In counting the number of sounds of each word in the vocabulary database T, the sound number count rules of the second embodiment are applied.

[0072]

The unsettled vocabulary decision unit U displays the candidate words selected as described above on the display 5, for example, in a search result list box. One word matching the melody is selected from the candidate words and decided as a melody word. This selection/decision is performed by a user or by using a random number similar to the template selection. If there is a database for relevant words, a target word can be selected based upon words before and after the target word.

[0073]

There may be a function of further dividing an unsettled part of speech in a template assigned a noun or verb, and modifier word + noun or

modifier word + verb may be re-selected as one word. For example, if a template is

[noun] は [noun] を [transitive verb]

and one modifier word is added to the noun and verb respectively, the template is changed to

[[adjective][noun]] は []adjective][noun]] を [adverb][transitive verb].

For example, if some section (segment) is assigned a [noun], a relatively long noun coincident with the number of sounds may be selected or the [noun] is further divided into [adjective] and [noun] to select the words having the same number of sounds.

[0074]

The function of reducing the number of candidate parts of speech can be improved further if accents of words are registered in the vocabulary database, and when a part of speech is searched from the vocabulary database, the characteristics of a melody are judged to select a word having an accent matching the characteristics from the vocabulary database.

[0075]

If there are melody sections having the same melody role among a plurality of melody sections, the same template is used for such melody sections. In this case, if parts of speech in one melody section have already been selected, the words of these parts of speech are preferentially selected as the words in another melody section having the same role. For example, if a melody has a measure structure of A1-B1-C1-A2-B2-C2, the same template is used for A1 and A2. If the first section (segment) of A1 is determined, candidate words for the first section of A2 are narrowed down to those words related to those selected for A1.

[0076]

The above embodiments are constituted of a personal computer and software. The invention may be applied to electronic musical instruments. The word composing program may be stored in a ROM. A tone generator, a sequencer, an effector and the like may be discrete devices which are interconnected by communication means such as MIDI and various networks.

[0077]

The format of melody data may be any format such as an "event + relative time" format which defines an occurrence time of a performance event by a time from one previous event, an "event + absolute time" format which defines an occurrence time of a performance event by an absolute time in music or in a measure, a "pitch (rest) + note length" format which defines performance data by a pitch and length of a note or by a rest and rest length, and a "direct storage" format which reserves a memory area corresponding to each minimum performance resolution and stores each performance event in the memory area corresponding to the occurrence time of a performance event.

[0078]

In the embodiments, the word composing program is stored beforehand in the hard disk. The invention is not limited thereto, but the word composing program may be recorded in a CD-ROM or CD-R and loaded in a hard disk. CPU 1 develops this word composing program upon RAM 3 and in accordance with the program read from RAM 3, performs the word composing process in a similar manner to the embodiments. In this manner, CPU 1 can perform similar operations to those when the word composing program is stored in ROM 2. With this arrangement, new installation, addition, version-up and the like of the word composing program can be made easily. The word

composing program may be recorded in a floppy disk, a magneto optical (MO) or the like and supplied to RAM 3 or a hard disk.

[0079]

The word composing program may be downloaded by using the communication interface 13. In this case, for example, the communication interface 13 is used for the connection to the communication network 16 such as LAN (a local area network), the Internet and a telephone line. The word composing program is distributed from the server computer 17 via the communication network and recorded in a hard disk to complete the download.

[0080]

A MIDI interface is not limited only to a dedicated MIDI interface, but it may be configured by using a general interface such as RS-232C, USB (a universal serial bus), IEEE1394 (I triple E 1394). In this case, data different from MIDI messages may be transmitted and received at the same time.

[0081]

[Effects of the Invention]

As described above, according to the word composing apparatus of claim 1, word composing method of claim 10 or the execution of the word composing program recorded in the recording medium of claim 15, it becomes easy to understand a relation between each note of a melody and a letter(s) or character(s) of song words. Therefore, effective aid can be provided to compose song words matching a melody.

[0082]

According to the word composing apparatus of claim 2, word composing method of claim 11 or the execution of the word composing program recorded in the recording medium of claim 16, continuous words separated in

respective input cells can be displayed as a continuous letter or character train and can easily be understood. Therefore, effective aid can be provided to compose song words matching a melody.

[0083]

According to the word composing apparatus of claim 3, the same functions and effects as those of claim 2 are obtained and words of a continuous letter or character train can be made easy to read. Therefore, effective aid can be provided to compose song words matching a melody.

[0084]

According to the word composing apparatus of claim 4, the same functions and effects as those of claim 2 are obtained and input cells still not input with song word letters or characters can easily be found. Therefore, effective aid can be provided to compose song words matching a melody.

[0085]

According to the word composing apparatus of claim 5, word composing method of claim 12 or the execution of the word composing program recorded in the recording medium of claim 17, a word can be selected by designating a part of speech. Therefore, effective aid can be provided to compose song words matching a melody.

[0086]

According to the word composing apparatus of claim 6, the same functions and effects as those of claim 5 are obtained and a word can be selected by designating the number of sounds and a part of speech. Therefore, effective aid can be provided to compose song words matching a melody.

[0087]

According to the word composing apparatus of claim 7, the same

functions and effects as those of claim 5 are obtained and a plurality of letters or characters can be made to have a correspondence to one note. Therefore, effective aid can be provided to compose song words matching a melody.

[0088]

According to the word composing apparatus of claim 8, word composing method of claim 13 or the execution of the word composing program recorded in the recording medium of claim 18, an order of parts of speech can be determined by simply selecting a sentence syntax template. Therefore, effective aid can be provided to compose song words matching a melody.

[0089]

According to the word composing apparatus of claim 9 or word composing method of claim 14, each section of melody can easily be made to have a correspondence to a part of speech. Therefore, effective aid can be provided to compose song words matching a melody.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig. 1] is a diagram showing examples of a word composing screen according to a first embodiment of the invention.

[Fig. 2] is a block diagram showing functions of the main part of the word composing apparatus of the first embodiment.

[Fig. 3] is a diagram illustrating an input operation of inputting a character or the like in an input cell according to the first embodiment.

[Fig. 4] is a diagram illustrating an input operation of inputting a display control command according to the first embodiment.

[Fig. 5] is a block diagram of the word composing apparatus utilizing a personal computer and software according to an embodiment of the invention.

[Fig. 6] is a flow chart illustrating a main routine of a word composing

program according to the first embodiment.

[Fig. 7] is a flow chart illustrating a word input/edit process according the first embodiment.

[Fig. 8] is a block diagram showing functions of a main part of a second embodiment.

[Fig. 9] is a table showing an example of the contents of a Japanese dictionary according to the second embodiment.

[Fig. 10] is a diagram showing input display screens corresponding to a search condition designating unit according to the second embodiment.

[Fig. 11] is a diagram showing an example of search results in a search result list box according to the second embodiment.

[Fig. 12] is a table showing another example of a Japanese dictionary according to the second embodiment.

[Fig. 13] is a block diagram showing functions of a main part of a third embodiment.

[Fig. 14] is a diagram showing an example of a sentence syntax template database according to the third embodiment.

[Fig. 15] is a table showing an example of a vocabulary database according to the third embodiment.

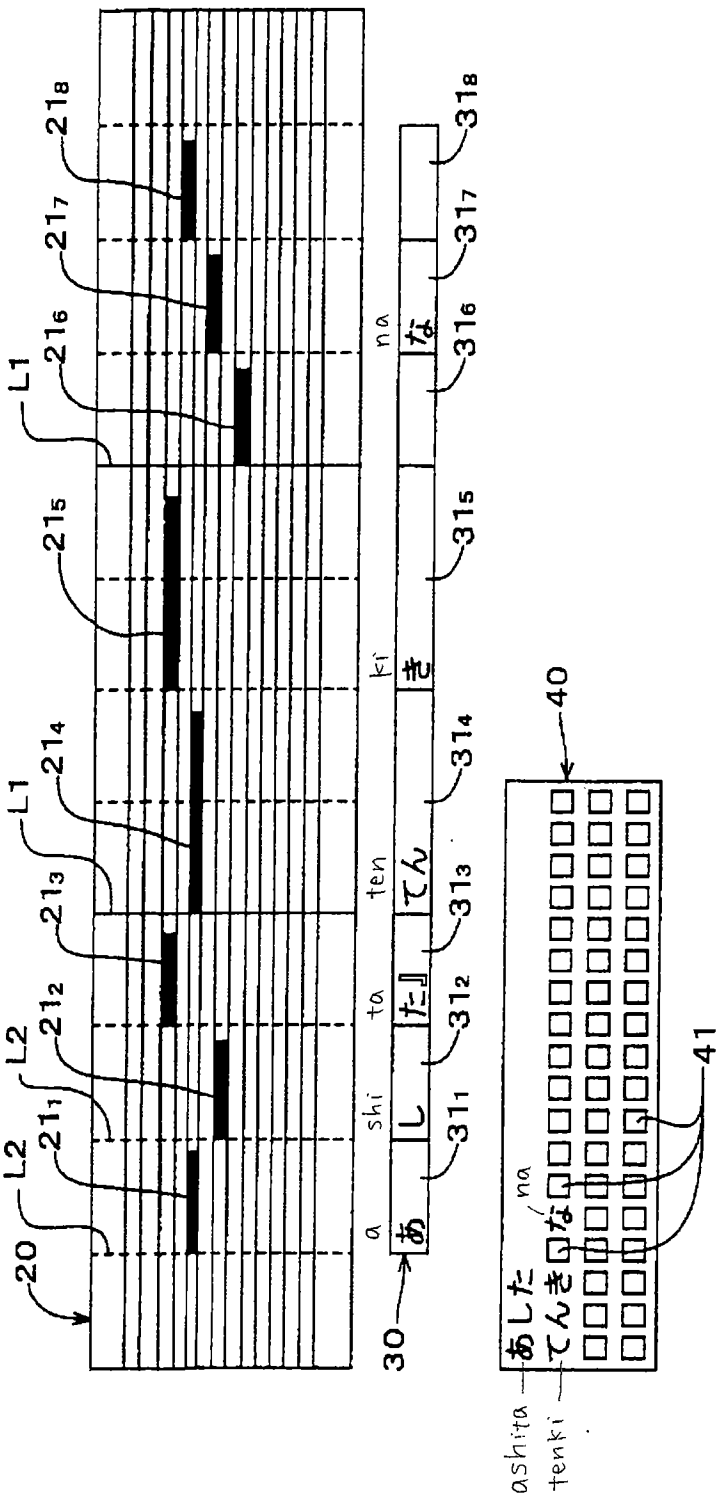
[Explanation of Reference Symbols]

1...CPU, 2...ROM, 3...RAM, 9...display circuit, 11...external storage device, 12...MIDI interface, 13...communication interface, 20...piano roll score, 21...note bar, 30...word input/edit area, 31...input cell, 40...word continuous display area, 41...non-input symbol, F...search condition designation unit, I...word search unit, J...Japanese dictionary,

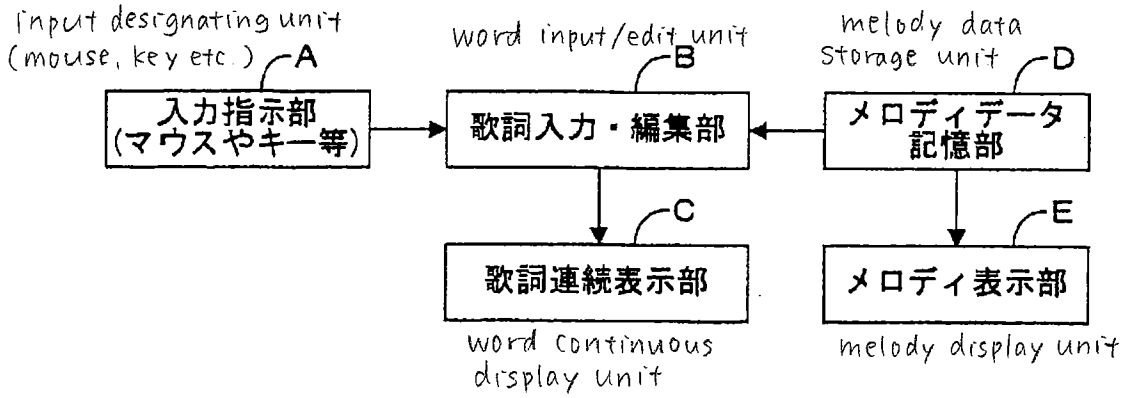
L...sentence syntax template database

NAME OF DOCUMENT　DRAWINGS
【書類名】　図面

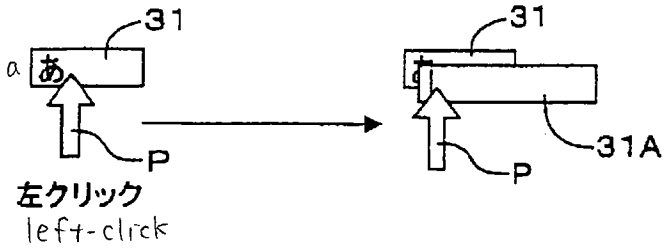
【図1】 Fig. 1



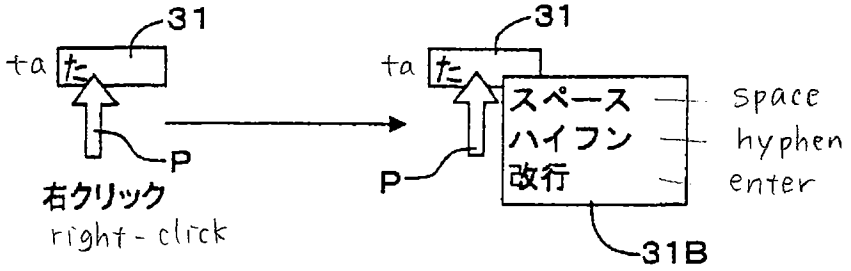
【図２】 Fig. 2



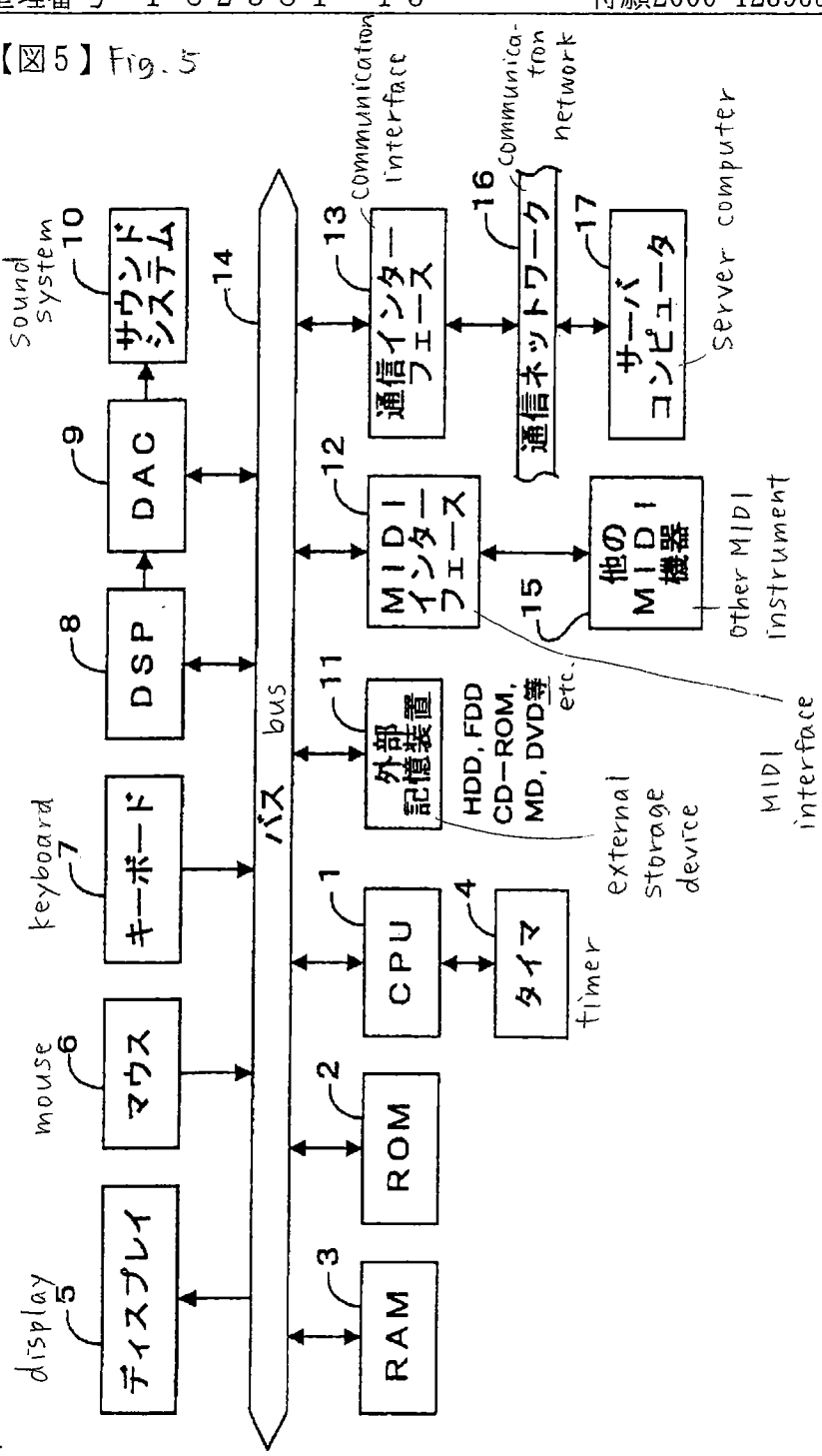
【図３】 Fig. 3



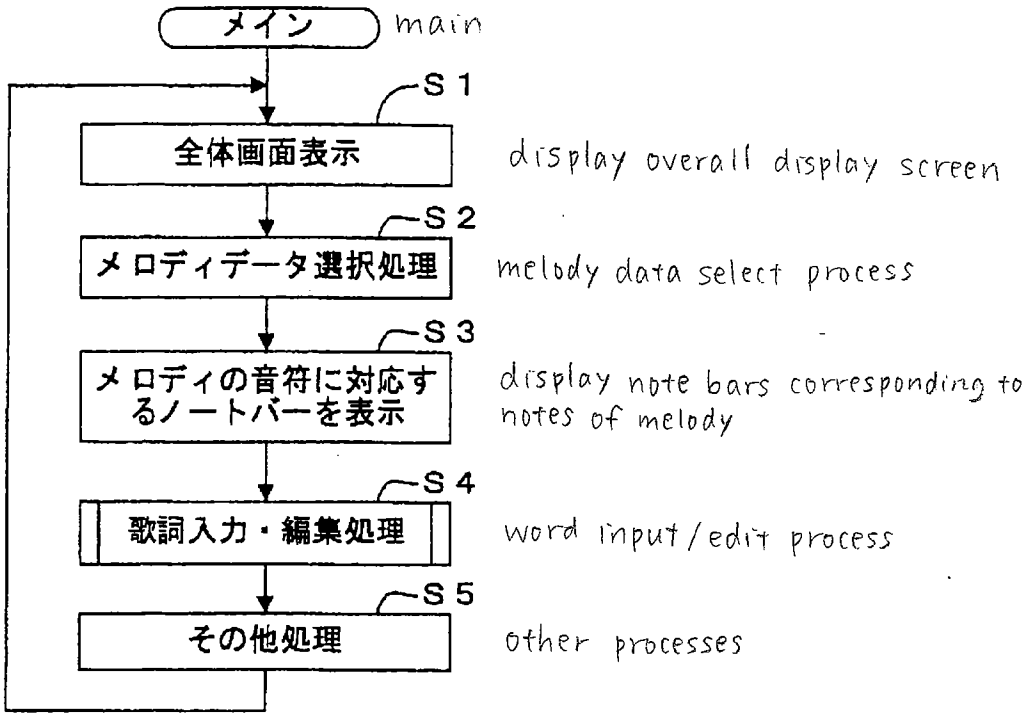
【図４】 Fig. 4



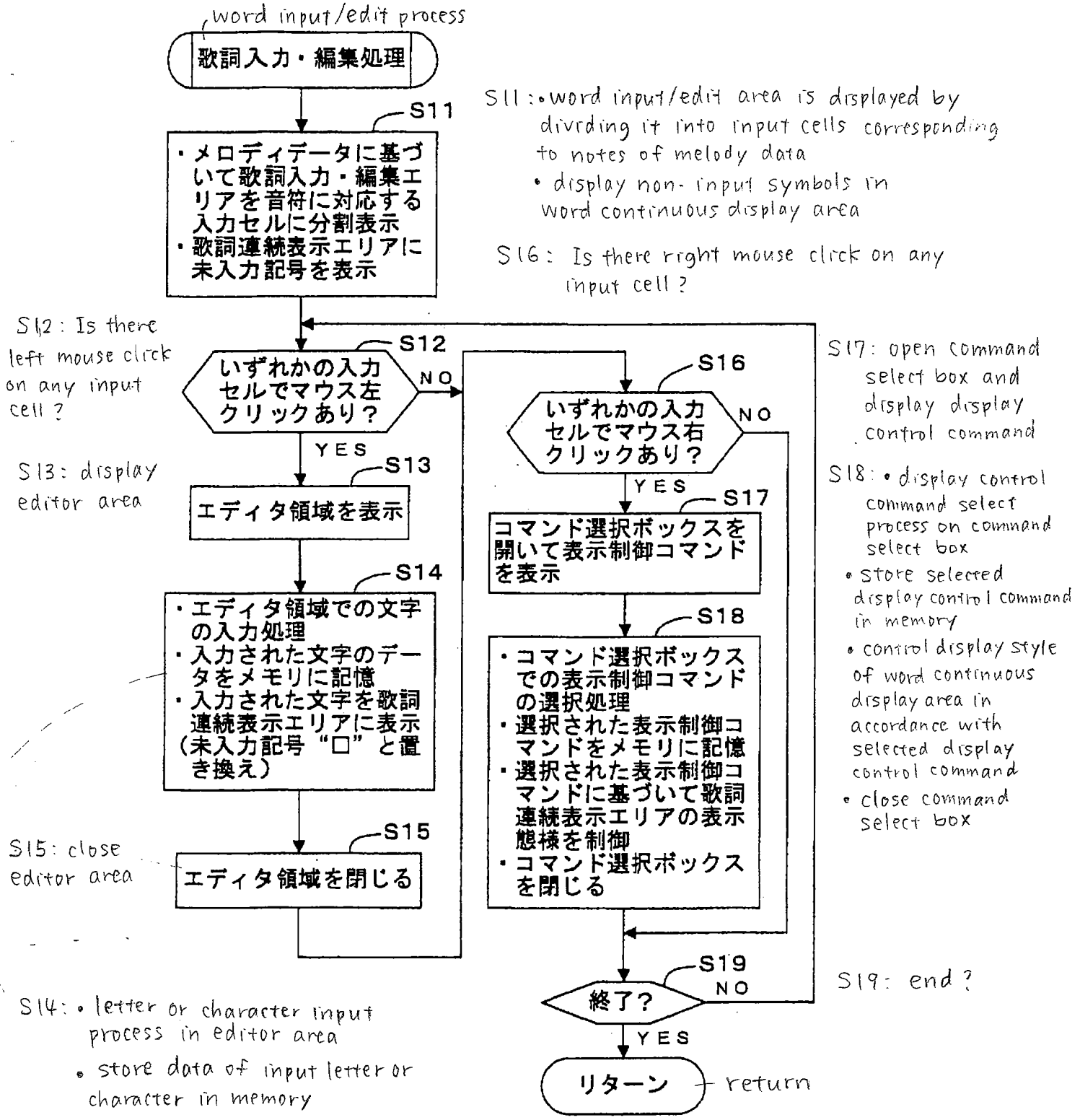
【図５】Fig. 5


display
5
ディスプレイ
mouse
6
マウス
keyboard
7
キーボード
8
DSP
9
DAC
Sound system
10
サウンドシステム
ROM
2
RAM
3
CPU
1
タイマ
4
timer
バス
bus
14
外部記憶装置
11
HDD, FDD
CD-ROM,
MD, DVD等
etc.
external storage device
MIDI インターフェース
12
15
MIDI interface
他のMIDI機器
Other MIDI instrument
通信インターフェース
13
Communication interface
通信ネットワーク
16
Communication network
サーバコンピュータ
17
Server computer

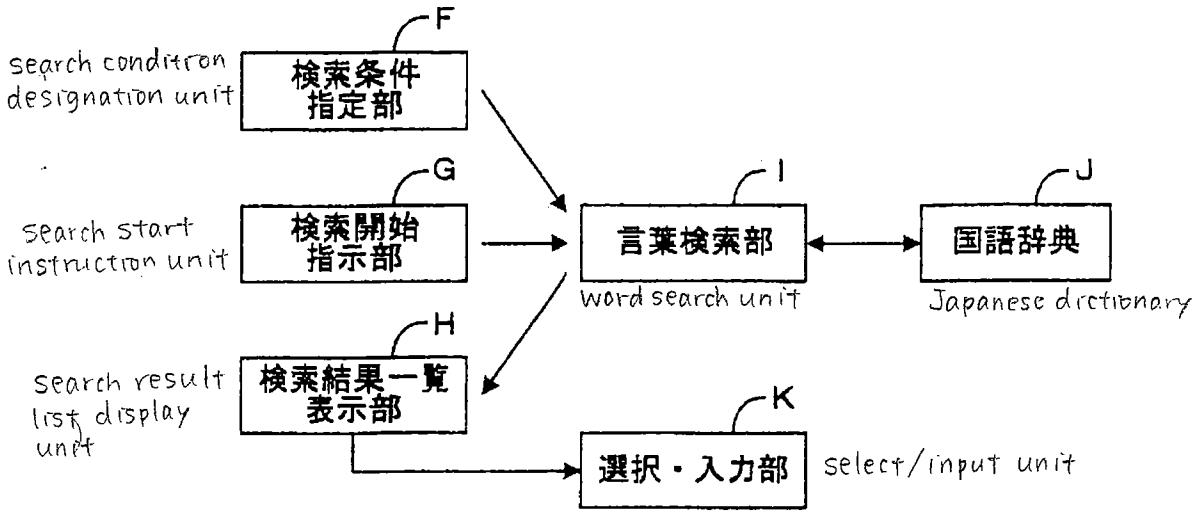
【図６】Fig. 6


メイン
main
S１
全体画面表示
display overall display screen
S２
メロディデータ選択処理
melody data select process
S３
メロディの音符に対応するノートバーを表示
display note bars corresponding to notes of melody
S４
歌詞入力・編集処理
word input/edit process
S５
その他処理
other processes

【図7】 Fig. 7


word input/edit process
歌詞入力・編集処理
S11
・メロディデータに基づいて歌詞入力・編集エリアを音符に対応する入力セルに分割表示
・歌詞連続表示エリアに未入力記号を表示
S11 : • word input/edit area is displayed by divding it into input cells corresponding to notes of melody data
• display non-input symbols in word continuous display area
S16 : Is there right mouse click on any input cell ?
S12 : Is there left mouse click on any input cell ?
S12
いずれかの入力セルでマウス左クリックあり？
NO
YES
S13 : display editor area
S13
エディタ領域を表示
S14
・エディタ領域での文字の入力処理
・入力された文字のデータをメモリに記憶
・入力された文字を歌詞連続表示エリアに表示（未入力記号“□”と置き換え）
S15 : close editor area
S15
エディタ領域を閉じる
S16
いずれかの入力セルでマウス右クリックあり？
NO
YES
S17
コマンド選択ボックスを開いて表示制御コマンドを表示
S17 : open command select box and display display control command
S18
・コマンド選択ボックスでの表示制御コマンドの選択処理
・選択された表示制御コマンドをメモリに記憶
・選択された表示制御コマンドに基づいて歌詞連続表示エリアの表示態様を制御
・コマンド選択ボックスを閉じる
S18 : • display control command select process on command select box
• store selected display control command in memory
• control display style of word continuous display area in accordance with selected display control command
• close command select box
S19
終了？
NO
YES
S19 : end ?
リターン
return
S14 : • letter or character input process in editor area
• store data of input letter or character in memory
• display input letter or character in word continuous display area (replacing by non-input symbol "□")

【図８】 Fig. 8

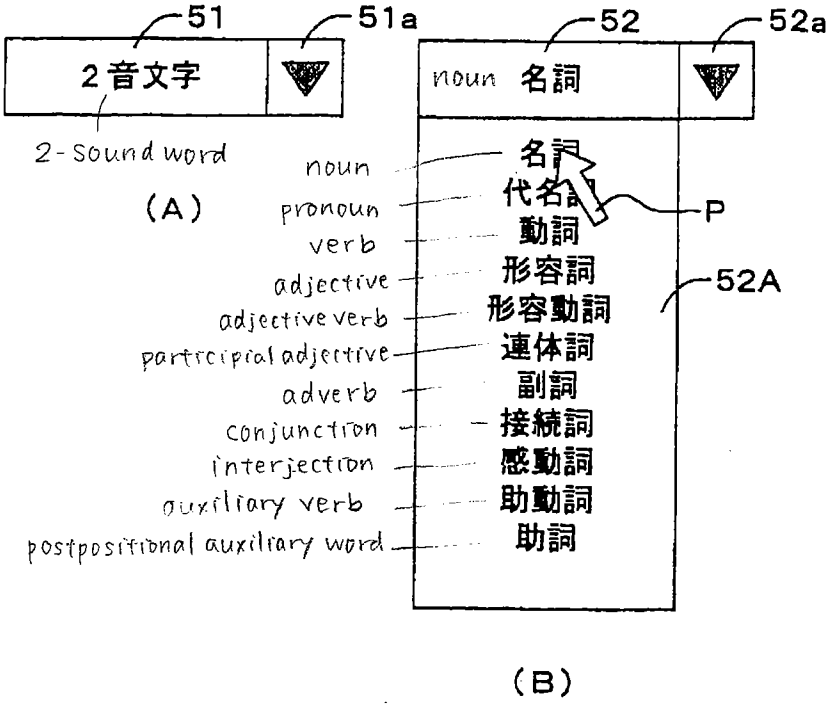


【図９】 Fig. 9

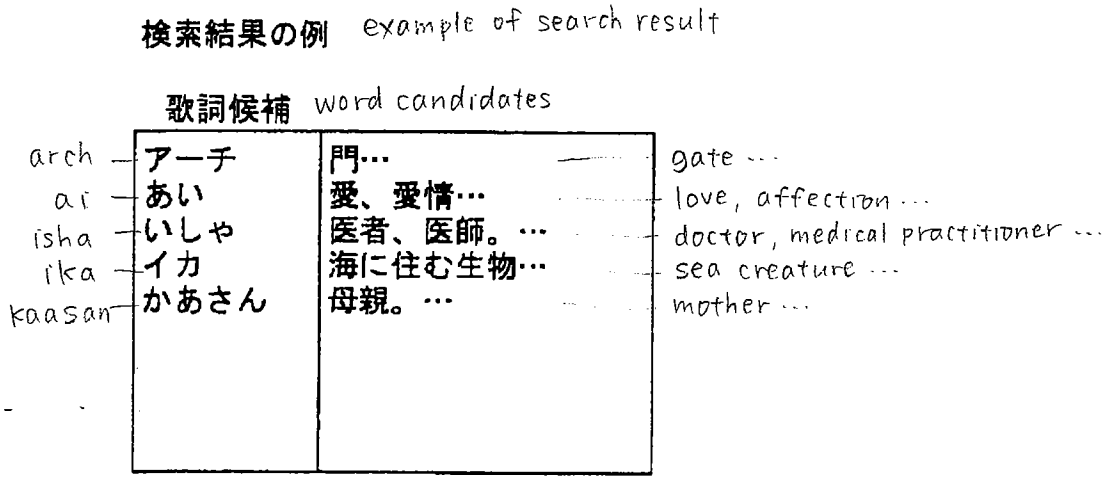
国語辞典の内容例 — example of contents of Japanese dictionary

	言葉 (word)	品詞 (part of speech)
arch	アーチ	名詞 noun
ai	あい	名詞 noun
aikidou	あいきどう	名詞 noun
	…	…
isha	いしゃ	名詞 noun
ika	いか	名詞 noun
imohori	いもほり	名詞 noun
	…	…
kaasan	かあさん	名詞 noun
kantan	かんたん	形容動詞 — adjective verb
	…	…

【図１０】 Fig. 10



【図１１】 Fig. 11



【図１２】 Fig. 12

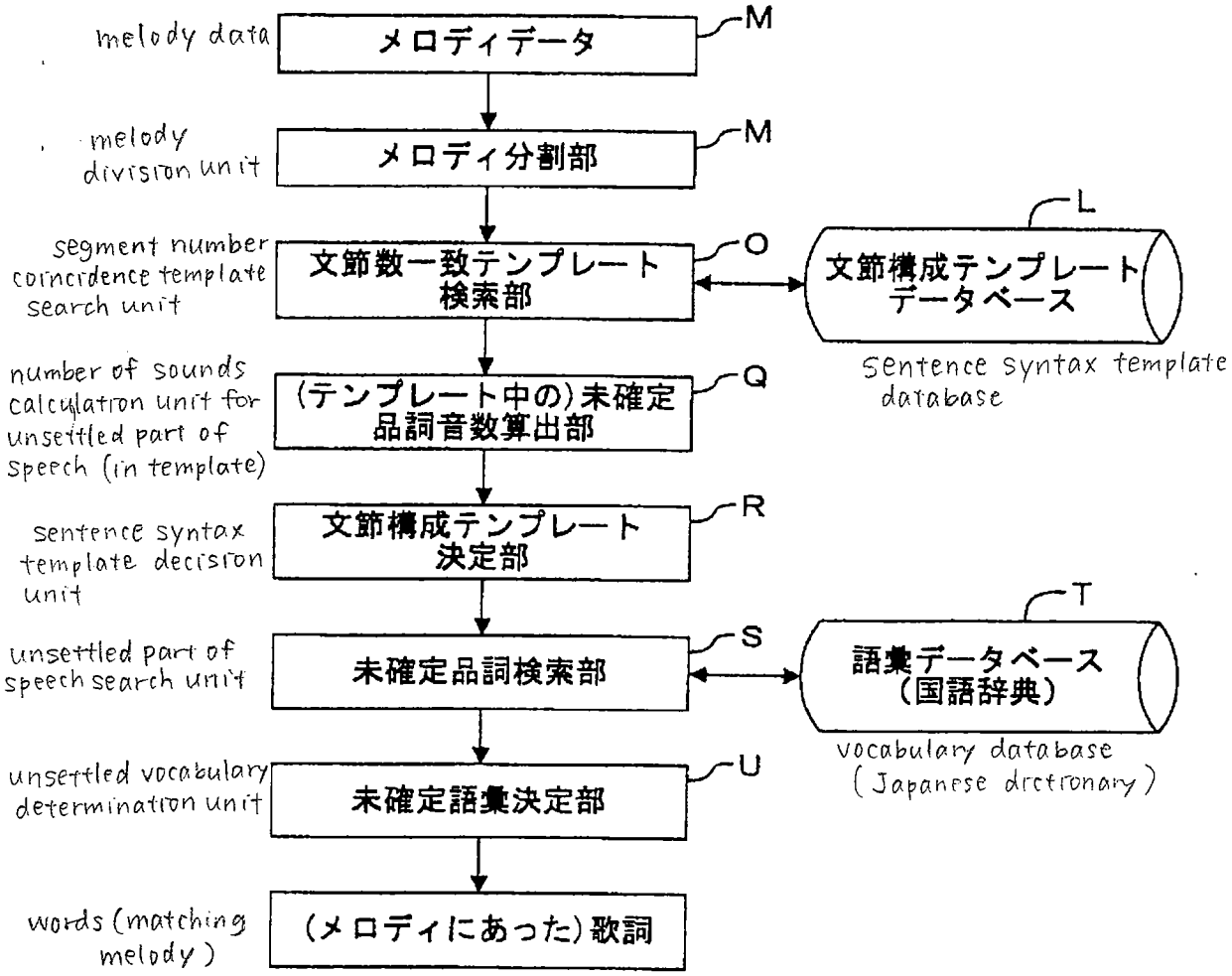
example of modification of Japanese dictionary

国語辞典の変形例

	言葉 (word)	品詞 (part of speech)	音数 (number of sounds)
arch	アーチ	名詞 noun	1、2
ai	あい	名詞 noun	1
aikidou	あいきどう	名詞 noun	4、5
	…	…	…
isha	いしゃ	名詞 noun	2
ika	いか	名詞 noun	2
imohori	いもほり	名詞 noun	2
	…	…	…
kaasan	かあさん	名詞 noun	2、3、4
kantan	かんたん	形容動詞	2、3、
	…	…	4…

adjective verb

【図１３】 Fig. 13


melody data
メロディデータ
M
melody division unit
メロディ分割部
M
segment number coincidence template search unit
文節数一致テンプレート検索部
O
L
文節構成テンプレートデータベース
sentence syntax template database
number of sounds calculation unit for unsettled part of speech (in template)
(テンプレート中の)未確定品詞音数算出部
Q
sentence syntax template decision unit
文節構成テンプレート決定部
R
unsettled part of speech search unit
未確定品詞検索部
S
T
語彙データベース(国語辞典)
vocabulary database (Japanese dictionary)
unsettled vocabulary determination unit
未確定語彙決定部
U
words (matching melody)
(メロディにあった)歌詞

【図１４】　Fig. 14

◆ 文節構成テンプレートＤＢの例　example of sentence syntax template database

[名詞]が[名詞]を[他動詞]	[noun]が[noun]を[transitive verb]
[名詞]が[名詞]へ[自動詞]	[noun]が[noun]へ[intransitive verb]
[形容詞][名詞]が[自動詞]	[adjective][noun]が[intransitive verb]
[名詞][名詞][名詞]	[noun][noun][noun]
[感嘆詞][形容動詞][名詞]	[interjection][adjective verb][noun]
[副詞][副詞][名詞]は[自動詞]	[adverb][adverb][noun]は[intransitive verb]
[自動詞][自動詞][名詞]	[intransitive verb][intransitive verb][noun]
[形容詞][名詞]と[形容詞][名詞]が[名詞]を[他動詞]	[adjective][noun]と[adjective][noun]が[noun]を[transitive verb]
[形容詞][名詞]が[名詞]を[形容詞][名詞]で[他動詞]	[adjective][noun]が[noun]を[adjective][noun]で[transitive verb]
[形容詞][名詞]が[名詞]を[形容詞][名詞]のように[他動詞]	[adjective][noun]が[noun]を[adjective][noun]のように[transitive verb]
.....	

【図１５】　Fig. 15

◆ 語彙ＤＢの例　example of vocabulary database

akai	あかい	形容詞	adjective
ame	あめ	名詞	noun
tsukue	つくえ	名詞	noun
hayai	はやい	形容詞	adjective
odayakana	おだやかな	形容動詞	adjective verb
subarashii	すばらしい	形容詞	adjective
hana	はな	名詞	noun
kitto	きっと	副詞	adverb
ah	ああ	感嘆詞	interjection
aruku	あるく	自動詞	intransitive verb
nagasu	流す	他動詞	transitive verb
utsukushii	うつくしい	形容詞	adjective
uta	うた	名詞	noun
.....			

[NAME OF DOCUMENT] ABSTRACT

[ABSTRACT]

[PROBLEM TO BE SOLVED] Composing song words matching a melody is made easy.

[SOLUTION] A piano roll score 20, a word input/edit area 30 and a word continuous display area 40 are displayed. Note bars 21_1, ...21_8 corresponding to notes of a melody are displayed on the piano roll score 20. The word input/edit area 30 is divided into input cells 31_1, ...31_8 having a length corresponding to a tempo number of each note bar 21. A pointer P is moved to the input cell 31 and a mouse is left-clicked to display an editor area 31A. A letter(s) or character(s) is input by using a word processor function. The pointer P is moved to the input cell 31 and the mouse is right-clicked to display a command select box 31B. A display control command is selected and input, the display control command controlling a display style of a song word character train in the word continuous display area 40. A dictionary database is used to search a song word by using the number of sounds and a part of speech as search keys. A sentence syntax is selected by using a sentence syntax template.

[SELECTED FIGURE] Fig. 1